Title (en)

Detecting propellant levels in spacecraft

Title (de)

Erkennung von Treibstoffständen in einem Raumfahrzeug

Title (fr)

Détection de niveaux de propulseur dans un véhicule spatial

Publication

EP 2769918 A1 20140827 (EN)

Application

EP 13275043 A 20130226

Priority

EP 13275043 A 20130226

Abstract (en)

A propellant tank assembly (100) for a spacecraft comprises a body (101) for containing propellant, and a plurality of tomography elements (201) disposed around the body (101) for detecting a distribution of the propellant inside the body (101). In an embodiment, the propellant tank body (101) includes a propellant management device (110) inside the body (101) and the tomography elements (201) are disposed in proximity to the propellant management device (110). Tomography data can be obtained from the plurality of tomography elements (201), and a distribution of propellant within the propellant tank body (101) can be determined based on the obtained tomography data. When the plurality of tomography elements (201) are thermal tomography elements including a plurality of temperature-control elements, the temperature-control elements can be controlled to redistribute the propellant inside the propellant tank body by heating and/or cooling the propellant.

IPC 8 full level

B64G 1/40 (2006.01); **F02K 9/60** (2006.01); **F17C 13/00** (2006.01)

CPC (source: EP US)

B64G 1/402 (2013.01 - US); **B64G 1/4021** (2023.08 - EP); **F02K 9/605** (2013.01 - EP US); **G01F 23/288** (2013.01 - EP US); F05D 2270/303 (2013.01 - EP US)

Citation (search report)

- [XI] EP 2103863 A1 20090923 - JAPAN AEROSPACE EXPLORATION [JP]
- [XI] US 5209115 A 19930511 - BOND DONALD L [US]
- [XI] JP S61122512 A 19860610 - ISHIKAWAJIMA HARIMA HEAVY IND
- [XI] AMBROSE J ET AL: "MODELING TO EVALUATE A SPACECRAFT PROPELLANT GAUGING SYSTEM", JOURNAL OF SPACECRAFT AND ROCKETS, AMERICAN INSTITUTE OF AERONAUTICS AND ASTRONAUTICS,REASTON,VA, US, vol. 37, no. 6, 1 November 2000 (2000-11-01), pages 833 - 835, XP000976095, ISSN: 0022-4650
- [XI] ROBERTI D ET AL: "ULTRASONIC VOID ESTIMATION SYSTEM FOR DETERMINATION OF LIQUIDS IN MICROGRAVITY TANKS", IEEE TRANSACTIONS ON INSTRUMENTATION AND MEASUREMENT, IEEE SERVICE CENTER, PISCATAWAY, NJ, US, vol. 37, no. 4, 1 December 1988 (1988-12-01), pages 642 - 647, XP000111039, ISSN: 0018-9456, DOI: 10.1109/19.9830

Cited by

CN110219750A; CN108019620A; FR3060117A1; EP3892966A1; WO2018104521A1

Designated contracting state (EPC)

AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

Designated extension state (EPC)

BA ME

DOCDB simple family (publication)

EP 2769918 A1 20140827; CA 2901831 A1 20140904; EP 2961657 A1 20160106; EP 2961657 B1 20170419; ES 2631691 T3 20170904; US 10189584 B2 20190129; US 2016001897 A1 20160107; WO 2014131802 A1 20140904

DOCDB simple family (application)

EP 13275043 A 20130226; CA 2901831 A 20140226; EP 14706831 A 20140226; EP 2014053745 W 20140226; ES 14706831 T 20140226; US 201414770400 A 20140226